



**Cluster Development Programme, India**

**DIAGNOSTIC STUDY**

**SME**

**THE FLORICULTURE CLUSTER**

**PUNE, MAHARASHTRA**

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**By MITCON, Pune**

**PREPARED UNDER THE AEGIS OF THE UNIDO PROJECT:  
SUPPORT TO COUNTRY EFFORT TO PROMOTE SME CLUSTER  
DEVELOPMENT IN INDIA, 2002-2005**

YEAR 2001

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# 1. INTRODUCTION

## 1.1 DESCRIPTION OF THE CLUSTER

### 1.1.1 Geographical Location

This greenhouse floriculture is mainly concentrated in Pune, Sangali, Satara, Kolhapur and Nashik districts of Maharashtra. The export oriented units of roses are mainly concentrated in Maval Block (near Lonavala ) of Pune District, because of its fertile virgin soil, year round availability of irrigation water, congenial climate, all season road, nearness to Mumbai, availability of road, rail and air transport and cheap labour. However, the cultivation of Gerbera and Carnation is spread all over the above mentioned areas.

### 1.1.2 Defining the Product

Pune floriculture is an agriculture-based cluster. Floriculture refers to growing of high quality cut flowers under controlled conditions in poly-house through the use of technology like tissue cultured plants, water soluble fertilizers, part-mechanization, cold chain, packaging and post harvest technology for export and domestic markets. The flowers that are mainly grown here are Dutch Rose, Gerbera and Carnation. The quality seedlings of all three types are imported from the European breeders. This is a fifteen year old agri-business that was started in India in the 1990s. All the technology at that time was imported from Netherlands. Hence the cost of establishing the project was high. The Dutch Roses are mainly cultivated by the corporate sector with the sole aim of export. The small farmers have also entered in this business and mainly grow Gerbera and carnation.

### 1.1.3 Basic Requirements

#### A. Important components for plant growth in Greenhouse:

##### a) Sunlight

The photosynthesis process of plants requires 30000 to 60000 lux sunlight. In India, the light intensity in summer season is up to 300000 lux. In such high intensity of sunlight, the plant growth slows down and therefore the greenhouse shading effect is required for a normal growth of plants.

##### b) Air (Carbon dioxide)

The open air composition of carbon dioxide is 3 percent (300/1000000), but inside the green house, the carbon dioxide ranges from 15 to 20 percent.

##### c) Ventilation :-

For natural ventilation, the windows or sides of a green house are opened and exhaust fans are also used for artificial ventilation.

**d) Temperature**

The temperature inside the greenhouse can be maintained by the following means

- 1) Use of Fan & pad
- 2) Use of exhaust fan
- 3) Use of drip & fogging method
- 4) By controlled sunlight

**e) Humidity**

The humidity inside the green house is about 50 to 80 percent. This high humidity is good for plant growth. However, dehumidifiers are required to keep the humidity levels under control as excessive humidity can lead to pest and other diseases.

**B. Construction of Poly-house:**

Before the construction of a polyhouse, a study of the climatic conditions and the geographical location for the necessary infrastructure in the area, must be done. It mainly includes studying the soil, environment, ground leveling, protecting from wind blow etc. To reduce the wind velocity, wind break trees are planted about 30m away from the poly-house. Besides that, a permanent irrigation water supply, vast land area, easy availability of labour, electricity, transport, all season roads, cold storage and cold chain transport facility up to the market is essential on the site

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**Types of poly-house on the basis of facilities:**

1. *Partial controlled:* In this poly-house, a controlled internal climate ventilation is essential. Temperature foggers are essential to reduce and increase humidity in poly-house.
2. *Fully controlled:* The internal climate inside the poly-house is controlled by controlling sunlight , temperature and humidity.

The construction of poly-house must be done in south – north direction to get more sunlight and reduce the shading effect of plants on each other. The G.I. steel frame must be light in weight but high in strength. The poly-film must be made from 200 micron plastic to protect from ultra violet rays of the sun. This plastic must be transparent to about 90 %.

The effect of all this increases the rate of photosynthesis and results in good growth of plants. A 1 kg of this plastic film covers 5.2 to 5.3 sq. m. area and the age of plastic is about 3-4 years. The cultivation of vegetables and flowers has been on a rise since last 5 years in this state. Small farmers have very well adopted a 500 sq.m area poly-house and are cultivating carnation, gerbera and yellow/red capsicum, tomato, cucumber and leafy vegetables. In Maharashtra, cultivation of vegetables, flowers and seeds in a poly-house is proving to be a profitable business.

**1. Site selection is Important**

Permanent source of irrigation water, good fertile newly opened well-drained soil, all weathered tar road, nearness to airport and seaport, easy availability of skilled and unskilled labor are the prime criteria of site selection.

**2. Land leveling**

This is very important for the erection of a poly-house. The promoters have to invest huge sums of money on leveling of land.

**3. Sterilization of Soil**

To protect plantation from soil borne diseases, pest, nematodes etc, sterilization of the soil is done by fumigation.

**4. Filling of soil**

At some undulating locations, the fertile soil cover gets removed during leveling of land. In this case, new soil filling is done after sterilization of the soil.

**5. Mixing of paddy husk in soil**

To increase the drainage capacity of irrigation before the erection of poly-house.

**6. The Poly-house construction**

The construction of poly-house is mainly done in southward direction to get a good supply of sunlight. Besides, wind break trees are planted about 30m away from the poly-house. First, the steel frame is erected and on that a 200 mm of poly-film is used, which is available in India through IPCL. Imported poly-film is also used in some poly-houses as it gives better filtration of sunlight and is more durable. But the cost of imported poly-film is high due to high import duty.

The erection work of a poly-house is completed in 6 months. There are many private poly-house erectors situated near in Pune. Previously the cost of poly-house erection was Rs. 500 per sq.m. But now it has come down to Rs. 400 per sq.m.

**7. Internal arrangement**

After erection, preparation of a raised soil-bed, levying of irrigation pipes, misting & foggers, fixing of shade nets and setting of internal paths etc is done as per the requirement in the poly-house.

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## 8. **Plantation**

*Roses:*

Seedlings for roses are mainly imported from the other countries. The rate of per plant ranges from Rs. 65 to 80 depending upon the variety, country and import duty. The variety in Indian roses is not much competitive in the foreign markets. The cost of rose seedlings range from 50-60 per sq.m. This comes out to be Rs.2 to 2.25 lakhs per acre. The distance between two rows of rose plants is around 85 cm and the width of the flower bed is around 50 cm.

*Gerbera:*

Gerbera seedlings are also imported from other countries. The cost of its seedlings is around Rs.26 per plant but it depends on the variety. The seedling requirement is around Rs.25000 per acre and Rs5 to 7per sq.m.

*Carnation:*

The cost of seedlings of an imported carnation is Rs15 per plant and that of the Indian one is around Rs7. The seedling requirement is Rs.88000 per acre and Rs22 to 25 per sq.m.

## 9. **Fertilizers / Insecticide & fungicides**

These are easily available in the domestic market. Some of the fertilizers are even imported. As the imported ones have their contents specified on the packaging, thus it becomes easier to administer the amount of dose required by the plants. The insecticides, pesticides and fungicides are available domestically and are imported as well. The cost of the imported chemicals is very high. Hence most of units use the Indian version.

## 10. **Drip / Sprinkler irrigation system**

Most of the units use either drip-system or micro sprinkler system to give optimum quantity of water to the plants. Fertilizers are also applied through drip irrigation itself. The materials required to set up the drip-irrigation system are easily available in the Indian market and are of international standards.

## 11. **Production**

*Roses:*

The production of roses starts after three months of plantation. The entire plantation is replaced after every eight years. The peak period of production is from October to March (almost 5000 roses per acre). However, between April to September, it comes toward cultivation of Gerbera and Carnation, which are mainly for domestic markets. The quality and the rate of a rose depends upon the length of its stem & its colour. The selection of variety depends upon

the demand of the foreign buyers. Mostly, the importers demand longer stems and shorter necks.

*Gerbera:*

The flowering of gerbera starts after three month of plantation. To begin with, the per acre production of gerbera is around 6.4 to 8 lakhs. This plantation is replaced after three years. The quality and the rate of flowers depend upon its size, colour and length.

*Carnation:*

The flowering of carnation starts after three month of plantation. The per acre production of carnation is between 6 to 7 lakhs per year. The carnation plantation is replaced after three years. Again the quality and the rate of flowers depends upon its size, color and stem length.

## 12. Harvesting

*Rose:*

Harvesting of rose flower is different for each variety. This process is mainly carried out by trained labour and is mainly done early in the morning. The number of times harvesting is done in a poly-house depends upon the temperature of that place. If the temperature is on a low side then harvesting is done only once.

*Gerbera:*

Harvesting of gerbera is done after complete blooming of flower. It also depends on the distance from the market. For local market, harvesting is done usually in the evenings and flowers are sent to the market the next morning.

*Carnation:*

Harvesting of flower is done at a proper stage before blooming.

## 13. Post harvesting process

*Roses:*

The cut flower with stem is dipped in a water bucket at a 5 cm water level. After that the flowers are kept in chemicals like florisent 600 and crysel to increase their shelf life. This process must be done within three hours of harvesting.

*Gerbera and Carnation:*

The harvested Gerbera and Carnation are also treated in the same way as the rose.

## 14. Grading and packing

*Roses:*

For export purposes, the required quantity of flowers are taken from cold storage and are graded according to the length of their stem that ranges from 10-90 cm or up to 120 cm. Usually, a healthy, strong and 2-3 leafed flower is

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selected. After that a bunch of 20 flowers is made and each bundle is wrapped in corrugated paper. Usually 5 bundles are kept in one corrugated box. The size of the stem depends upon the demand of the importers.

*Gerbera and Carnation:*

These two flowers are mainly marketed in the domestic market. They are graded according to their colour and stem length. After grading, a bunch of 20 flowers (in case of Carnation) and 10 flowers (in case of Gerbera) is made. Then each bundle is wrapped in corrugated paper and 12 to 15 bundles are kept in one corrugated box.

## 15. Cold Storage

The temperature of the cold storage must be between 10 to 30°C for export purpose. Besides this, pre-cooling facility should also be provided on site. Boxes require 10 to 20 hrs in efficient cold storage. As the Gerbera and Carnation are meant only for domestic markets so they do not require any cold storage.

To export, the boxes are removed from the cold storage and are transported to aerodrome by reference.

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## 16. Market & Marketing

*Roses:*

Roses are exported mainly to Switzerland, Germany, Japan, U.S.A., UK, and Sri Lanka. The export is done both through domestic as well as foreign agents. The quantity demanded for exports is always the fluctuating. The demand is more at the time of new year's, Valentine and Christmas days.

As all the units are export-oriented thus only 10-30% of roses are sold in the domestic markets. These flowers are mostly second grade ones. The domestic market is limited to the metropolitan and other main cities.

*Gerbera and Carnation:*

These flowers are only for domestic markets i.e. metropolitan and other main cities. The main channels for marketing is:

- 1) Producers - Consumer
- 2) Producers - Wholesaler – Retailers – Consumer
- 3) Producer - Merchants – Buke maker – consumer

Till date no one has taken efforts for the exporting Gerbera and carnation.

**17. Industrial Space:**

*Roses:*

As all units are big and export oriented so the promoters have purchased the required agri-land through own investments in Maval Block. After that the leveling of land, arranging for irrigation facilities, construction of the poly-house etc was also mainly done by own investments. However some promoters availed for bank financing also.

**Gerbera and Carnation:**

The units involved in growing these flowers are mostly small promoters and farmers. The minimum size of unit here is 500 sq m. and the maximum is 4000 sq. m. These units are financed by nationalized and co-operative banks. Subsidies are also given by the National Horticulture Board and the State Agriculture Department.

**18. Entrepreneurial Background:**

Originally all promoters were entrepreneurs diversified towards the floriculture industry. Almost all the export oriented units are proprietary units. The smaller units are also run by progressive farmers who were diverted towards floriculture due to the subsidized schemes provided by the State Agriculture Departments. They were trained in Pune by the Agriculture College training center.

**19. Labor Structure**

*Roses:*

This floriculture industry requires both technically skilled as well as unskilled staff. The office staff works on the day to day records and accounting etc. The technical staff takes care of the technical aspects of floriculture. The skilled labour mainly works on harvesting, grading, sorting, packing and handling the flowers. The unskilled agri-labour is mainly involved in activities like weeding, irrigation, poly-house maintenance etc. Usually there are 4 office staff and 25 unskilled personnel requirement in a unit. The unskilled labour is available around the local area of units. However, the skilled labour is not readily available. Even though no highly skilled labor is required for the job, still the corporate sector is giving thrust on training of labour.

*Gerbera and Carnation:*

The small farmers hardly employ outside labour for daily work. But if the size of the unit is more than 1000 sq.m then he/she hires skilled labour for spraying. Usually the farmer trains his family for day to day works of a poly-house.

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### 1.1.4 Current Output

#### AREA UNDER CULTIVATION OF ROSES OF EOUS

No	Name of EOUE	Old Area Ha	New Area	Total	Flower/day production
1	Ace Agro	2.0	-	2.0	10000
2	Essar	4	-	4	20000
3	Deccan	7.5	-	7.5	40000
4	Horizon	5.5	-	5.5	25000
5	Praj	3	-	3	13000
6	Vikram	6	-	6	30000
7	Farmteck	3.5	-	3.5	14000
8	Pittee/HFL	3	-	3	14000
9	J & Drew	-	2.25	2.25	----
10	Fila rozil	3	-	3	13000
11	Global	2.6	0.7	3.3	11000
12	Neha	1.4	-	1.4	5000
13	Soex Flora	7		7	20000
14	Century	4.5		4.5	16000
15	Global K				
16	Rosa Gardenia	1.75	-	1.75	7500
17	Arya Global				
18	Eligent	1.0	-	1.00	5000
	Total	55.75	2.95	58.70	2,40,000

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#### PRODUCTION OF GERBERA, CARNATION AND ROSES BY FARMERS

No.	Name of block	Name of Flowers	Area under cultivation	Production Flowers
1	Junnar	Gerbera		
		Carnation		
		Roses		
2	Ambegaon	Gerbera		
		Carnation		
		Roses		
3	Khed	Gerbera	3 Acre	24,00,000
		Carnation	3 Acre	18,00,000
		Roses	1.5 Acre	12,00,000
4	Haveli	Gerbera		
		Carnation		
		Roses		

## 1.2 CORE CLUSTER ACTORS

### 1.2.1 Export Oriented Units

In Pune district, there are 16 export oriented units that came up in the 1990s. Their size ranges from 2 ha to 7.5 ha. These are owned by people from other corporate sector who decided to diversify into floriculture. They are growing mainly Dutch Roses and are exporting 60 to 70 per cent of the produce.

### 1.2.2 Small Units

In Pune district, there are 100 small floriculture units ranging from 500 to 4000 sq m. Small farmers run these units successfully and mainly grow Gerbera and Carnation for the domestic markets.

## 1.3 OTHER CLUSTER ACTORS

There are a number of other people who contribute to the activities of this cluster and thus play an important role. They can be classified as follows:

### 1.3.1. Department of Horticulture

The Department of Horticulture is one of the important cluster actors. This department plays an important role in promotion of floriculture and supports the farmers by giving them subsidies. The State Agriculture Department gives subsidy @ Rs. 70000, 50000 and 20000 for G1, G2 and G3 type respectively for a 500 sq m poly-house. The department works as a nodal implementation agency for centrally sponsored floriculture development scheme.

### 1.3.2. National Horticulture Board

The National Horticulture Board is an important cluster actor in promotion of floriculture. A number of developing schemes are implemented by the NHB for promotion of floriculture through State Agriculture Department. The NHB gives 20% subsidy for floriculture projects that costs up to a limit of Rs.25 lakhs.

### 1.3.3. Maharashtra State Agriculture Marketing Board

This is an apex board of all Agricultural Producing Marketing Committees of Maharashtra. MSAMB is setting up a Rs14 crore national level post harvesting technology-training center for horticulture & floriculture. Technical support for this hi-tech center will come from an innovative practical training center of Netherlands and financial assistance from FMO, Holland. They are conducting six day residential training programmes in floriculture for new entrepreneurs. The fee for training is Rs 3500.

#### **1.3.4. Agriculture College, Pune( Hi-tech Training center)**

The Government of Maharashtra had sanctioned one of the hi-tech floriculture projects at the Agriculture College, Pune, during 1998-99 under '*Vaidhanic Vikas Mandal*'. The main objective of this project was to establish the facilities for training, demonstration and research on Green house technology for flowers and vegetables for the farmers, the field staff of Agriculture department and the students of the agriculture college.

This center conducts six days technical training in floriculture and the fee for training here is Rs.1100. This training institute has own poly-house with post harvest and cold chain facilities. On the job training facility is also available. A total of ten poly-houses are erected and have been given on subcontract to fresh agriculture graduates. These graduates actually grow cut flowers, which they then sell in the domestic market for a period of one year.

#### **1.3.5 FAO Assisted Floriculture Project at Rajgurunagar**

One green house floriculture project has been established at Rajgurunagar with assistance from FAO, New Delhi. The main objective of the project is to grow gerbera & carnation on semi commercial basis for marketing the produce in the domestic market, and to demonstrate advanced technology to the traditional flower growers of cat flowers.

#### **1.3.6 Western India Floriculture Association (WIFA)**

This is the only association of floriculture export oriented units registered under the Companies Act. There are 16 EOUs as members of this association. They play more of lobby role than developmental one for the industry.

#### **1.3.7 National Chemical Laboratory**

The State Government has also taken up initiative to provide the best planting material for various horticultural crops. It has recently established a state of the art tissue culture laboratory at Marathawada Agriculture University, Parbhani along with the National Chemical Laboratory (NCL), Pune.

#### **1.3.8 Maharashtra Floriculture Development Board**

This board was developed and established as a sister organization of the Maharashtra State Agriculture Marketing Board in 1993. The board has renowned florist, nursery-men, scientists and representatives of cooperative organizations as its directors and has established a training center for green house cultivation with the assistance of Innovation and Practical Training Center, Holland. They have even erected around ten poly-houses for farmers and two Post-harvest Training Center.

#### **1.3.9 Maharashtra Industrial Development Corporation. (MIDC)**

Pune and the surrounding Western Maharashtra region are set to emerge as a major player in the international floriculture market. APEDA & banks are working on a rehabilitation package to review the export oriented floriculture units, most of which are in Maval block of Pune. The initiative taken by M.I.D.C. and APEDA is to set up a Talegaon Floriculture Park on 210 hectares of land. Cebesco of Holland has been

appointed as the adviser for development of the park. A plan for 50 ha. is ready for development, consisting of 140 plots (116 by 116 mts.). MIDC will provide water, roads, electricity etc and entrepreneurs can build their campus in the park. This will be a common infrastructure for the floriculture units.

#### **1.3.10 . National Bank for Agriculture and Rural Development**

NABARD is playing an important role in refinancing to commercial banks. NABARD is organizing the seminar on floriculture at district level.

#### **1.3.11 The Rose Society of Pune**

The Rose Society of Pune is established by nursery owners around Pune. The Rose Society organizes flower shows and conducts training in flower arrangement.

#### **1.3.12 Maharashtra Agro. Industrial Development Corporation (MAIDC)**

MAIDC is establishing Flower Auction House at Goregaon, Mumbai. The APEDA is funding for the same.

### **1.4 CURRENT INSTITUTIONAL MATRIX**

The cluster hardly has any active support/service institution to guide it in the right direction. A few Government agencies provide activity-oriented support to the cluster. The department of agriculture is implementing the schemes for floriculture.

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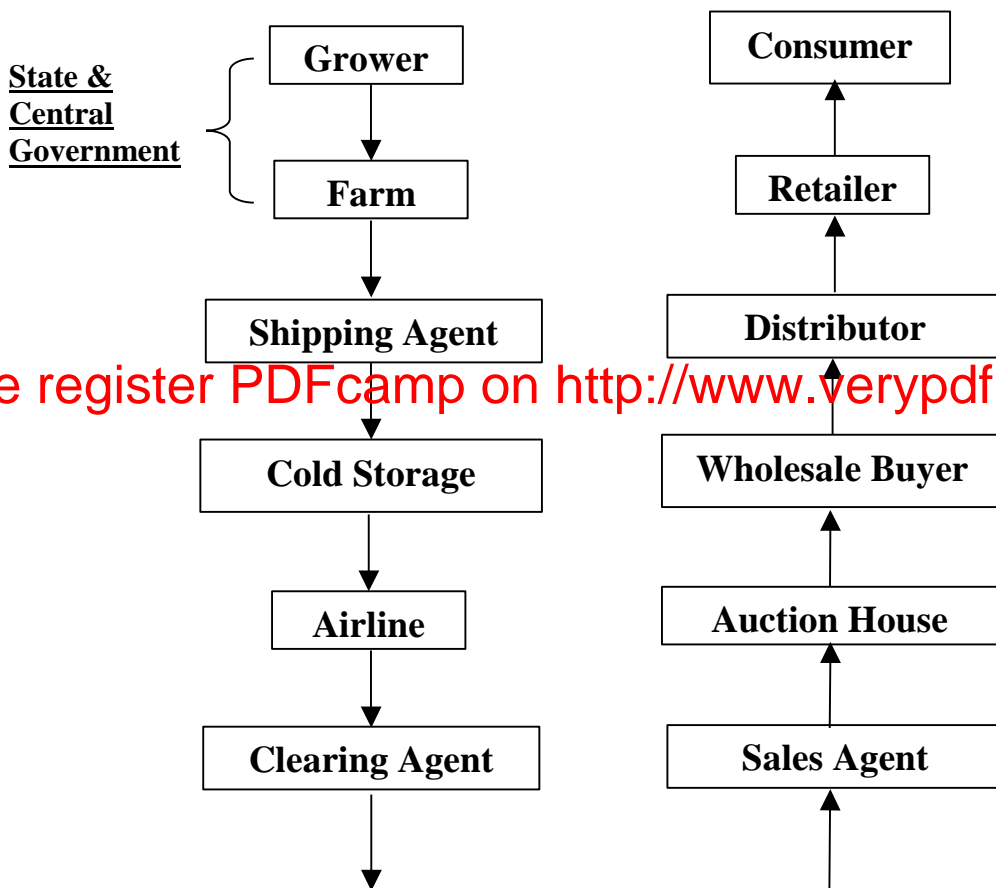
The following support institutions will be targeted during the course of interventions in the cluster:

- Department of Cooperatives: - For registration of the Cooperative societies of small farmers.
- Department of Agriculture: - For implementation of the sponsor's schemes for farmers and corporate unit.
- MCCIA:- For workshops.
- National Horticulture Board :- For Developmental Schemes
- Agriculture Hi-tech Centre, Pune:- For Technical Training
- College of Agriculture, Pune :- For R&D activities & other technological interventions.
- NABARD: For credit requirements
- Maharashtra State Agriculture Marketing Board:- For marketing of Flowers.
- Western India Floriculture Association:- For developmental lobbying of export oriented units.
- APEDA: - For export promotion.
- MSAMBs Horticulture Training Center, Talegaon Dabhade,

## 2 VALUE CHAIN ANALYSIS

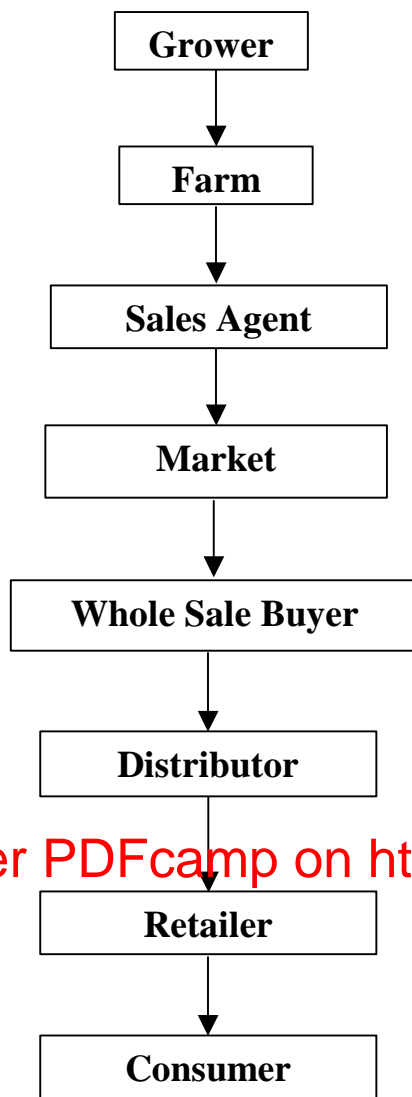
### 2.1 FOR EXPORT PRODUCTS

The below given value chain of Indian Floriculture produce that is exported shows clearly that most of these steps comprise of middlemen and that there is a huge loss of money and quality at each of these steps. With proper policy measures, various links in this value chain can be reduced. For example, all the middlemen from clearing agent up to the distributor can become redundant with direct marketing and the benefits could actually go directly to the farmer.



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## 2.2 VALUE CHAIN FOR DOMESTIC MARKET



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### **3. REALITY TREE**

#### **3.1 POLICY CHANGE**

Declaring of the entire floriculture as an agriculture activity is not only logical, but will also ensure that the growers enjoy benefits like income tax relief and are free from other unnecessary regulatory provisions such as the Pollution Control Act, Shop Act License, Sales Tax Registration or Profession Tax Registration etc.

#### **3.2 CONSORTIUM APPROACH**

This is necessary to ensure the following

- i. Common branding of the product.
- ii. Uniform grading, packaging and quality assurance of the product by obtaining ISO and Good Agriculture Practices (GAP) certification etc.
- iii. Assuring an optimum quantity for economical surface and air transport.
- iv. Assuring priority for flowers over other commodities at the airport at the time of loading.
- v. Assuring an uninterrupted supply of products to the market.
- vi. Developing of new markets.
- vii. Ensuring a better bargaining power in the market.
- viii. Developing and popularizing new types and varieties of flowers.
- ix. Undertaking an integrated R & D activity.

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#### **3.3 LOCATIONS**

The locations of the export-oriented units satisfy the geo-climatic requirements and also has nearness to the international airports, which can provide direct connections to the markets abroad. On the former criterion, as experience has already indicated, the locations near Delhi are not suitable. The climatic conditions in South India are relatively better. Therefore, at least initially, focus should be only on the existing areas of cultivation around Mumbai, Bangalore and Chennai airports. The incidence of success of floriculture units in these areas is higher and it must be consolidated before other areas are taken up.

#### **3.4 SCALE OF PRODUCTION**

NABARD has provided a project brief, which indicates that a farm of 1 Ha size is economically feasible. However, from transport, storage and export consignment points of views it proves to be a very small farm size. A farm of 1 Hz size can be feasible only if it is a part of a consortium, or if it is located in the Floriculture Park or if it is a satellite farm of a larger farm. As an independent unit, an economic farm has to be of a minimum range of 7-15 Ha.

### **3.5 ESTABLISHMENT OF LINKAGES**

In Floriculture, there are several ministries and departments of the State and Central Governments, right from Gram Panchayat at local level to Central Government offices at New Delhi that are involved and whose permissions and clearances are required for various processes. In addition, there are developmental agencies and financial institutions. A list of all these institutions is provided in the Annexure 2.

### **3.5 MARKET DEVELOPMENT**

There are four aspects related to market development. They are: (a) Promoting the India brand, (b) Marketing directly to some European countries like Germany, (c) Expanding the geographical reach to cover other countries apart from Europe and Australia and (d) Developing market for other varieties of Indian flowers.

These aspects should be systematically planned. For establishing India brand, we must assure quantity and quality. While income tax relief and other fiscal measures must be introduced to the growers for meeting losses etc, no compromise should be made on imposing penalties if promised supplies are not made or the quality is not maintained. The offices, which are common to all the growers should be established in important foreign markets by the growers or their consortia themselves and their initial administrative expenses should be subsidized. One of the functions of these offices would be to test market different types and varieties of flowers.

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Liberal assistance should be given to advertise our flowers, their availability, prices and supplier information on the Internet. At present, the marketing expense for floriculture is 30% of the gross price obtained. Efforts need to be undertaken to bring this cost down. Availability of internet trading can bring down these costs to quite some extent.

### **3.6 INFRASTRUCTURE DEVELOPMENT**

India's advantage in floriculture is not only in terms of labor cost and climate but also in infrastructure. Unfortunately however, almost all the units have to struggle to get adequate infrastructure. The State Government should provide a good, all-weather road to the units. The electricity, water and communication channels should be provided in adequate quantities. All the three international airports at Mumbai, Chennai and Bangalore should have cold storage facilities. The customs personnel should be given necessary training for faster yet careful clearance of the produce.

### **3.7 TAXATION AND INCENTIVES**

In addition to a relief in income tax, there should be no excise duty on floriculture products sold in the local markets. There should also be no tax on royalties paid by

the growers abroad. While no subsidy is suggested for floriculture as such, simple procedures, speedy clearances and transparent controls are absolutely necessary.

### **3.8 RESEARCH AND DEVELOPMENT**

There are several areas where research and development needs to be taken up immediately. They are:

- a) Suitable types and materials for poly-houses.
- b) Development of indigenous pesticides and fungicides, preferably those derived from plants thus making them use eco-friendly.
- c) Development of flower varieties similar to those exported.
- d) Development of other novel indigenous flower varieties for export.
- e) Development of better and high yielding varieties for domestic market.
- f) ISO certifications for floriculture activity should be obtained.
- g) Development of better post-harvest technologies in different climatic conditions.
- h) Development of packaging material.
- i) Reviewing cultivation practices under varying climatic conditions for the export-able flowers.
- j) Standardization of organic farming practices for floriculture crops.
- k) Standardization of seed production and hybrid varieties from selected crops.
- l) Exchange of scientists working in the fields of floriculture and greenhouse technology between countries having similar climatic conditions.

### **3.9 OTHERS**

Training is a serious input that is seriously lacking in this cluster. A two-year post-graduate course or alternatively a one-year diploma course at the polytechnic level should be developed for floriculture, that should not only cover the technical aspects but also the subjects like Good Agriculture Practices, ISO certifications, Hygiene, Management and Finance.

A continuous up-gradation of knowledge is also essential for cultivators and other people employed in floriculture. Short duration, tailor-made agriculture universities can conduct training programs for the latter.

New research and incentives should be provided for the emerging areas of dry flower preparations as well as essential oil industry and flower remedies to make these more popular with the public.

There are numerous Internet sites available on floriculture. Creation of a portal should be encouraged that will enable the sellers to directly contact buyers and displays the current Indian products along with their photographs. They can even have a quick access to the climatic and market information in different exporting and importing countries. The facility for Internet trading should be immediately provided.

#### **4. PROBLEMS IDENTIFIED**

There are at present two market segments in Floriculture. One, which is the traditional one and prefers flowers that are cheap, scented and have a short shelf life. They are mainly used in worships, for garlands and as hair adornments. The market for such flowers is huge, growing and is fed by the local and regional production. The entire trade in such flowers is unorganized.

The other market is that of exports. Here the flowers preferred are that of superior quality, with long stems and a longer shelf life. They are used mainly for decorative and gifts purposes. There is a significant cost and price difference between the two segments. So far these two segments have remained separate but now the second segment seems to be picking up in the Indian metro cities as well. However,

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intensive marketing and promotion efforts are needed on this front. The production for exports is not so easy. There are several problems identified in the entire value chain. The production is extremely capital intensive as it is dependent on imported technology, with no indigenous knowledge to replace it. Everyone in the value chain, the producer, the consultant, the transporter, the banker and the Government are learning by experience.

#### **The floriculturists are facing the following problems:**

- Since the floriculture activity is regarded as an industrial activity, it has to comply with several procedures and provisions that are not at all relevant to it.
- For many units, the scale of production is too small to reduce the cost of production, to attempt diversification or to market effectively.
- There are several agencies involved that do not have any effective linkages.
- The insurance coverage is limited and involves abnormal delays.
- Lack of basic infrastructure like road, water, electricity and telephone.
- Very high rate of interest on term loans.
- Excise duty on local sales.

- High air-freights.
- Absence of quality assurance manuals.
- Lack of standards and facilities for inspecting chemicals and fertilizers.
- High rates of royalty payment to foreign breeders.
- Import duty on Indian flowers that are exported to Europe is between of 9 to 12 percent which is abnormally high.
- Difficulties in importing pesticides and fungicides.
- Elaborate procedures and delays in claiming subsidies.
- Income tax is deducted at source even on the interests on fixed deposits kept with banks as collateral for working capital loan/ cash credits.
- No training in floriculture to the workers and managers.
- Lack of awareness of the requirements of floriculture on the part of bankers, custom officers and even some development agencies.
- Poor Indian image in the foreign markets due to unscrupulous practices followed by few producers/exporters.

Many of the above mentioned problems are faced by almost all sectors in the country. The cost incurred so far on this activity which is regarded as a high priority sector and the success record of those who are still managing to produce and export, was to tackle these problems on a war footing.

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## 5. Cluster Vision

INCREASING AREA UNDER CULTIVATION BY 25% .

## 6. STRATEGY

The strategy for intervention would be multi pronged and can be broadly listed as

1. Market expansion
2. Increase in area of cultivation
3. Technical training
4. Improvement in infrastructure facilities
5. Formation of groups/ societies / networks
6. Networking small farmer units with medium corporate units
7. Diversification
8. Subcontracting
9. Institutional Linkages

### i. INCREASE IN AREA OF CULTIVATION

**Necessity:** To generate economies of scale in harvesting, post harvest activities and marketing.

**Expected Outcome:** At least 20% increase in area under cultivation would be achieved.

SI_No.	Activities	Time period	Beneficiaries
1.1	2 Exposure visit of small farmers to Sangli floriculture units	Q1	20 small farmers
1.2	Selection and training of potential farmers for setting up floriculture units	Q1-Q3	20 small farmers

### ii. MARKET EXPANSION

**Necessity:** Unless both domestic and exports are increased, the increased area under floriculture may not be sustainable.

**Expected Outcome:** Additional sales would be generated

SI_No	Activities	Time period	Beneficiaries
2.1	Organizing participation of small farmers in flower shows	Q1-Q4	50 Farmers
2.2	Diversification in to summer flowers and other varieties of flowers	Q1-Q3	10 farmer units
2.3	Setting up Kiosks to promote flower shows	Q1-Q2	5 Kiosks
2.4	Training of unemployed youth in flower arrangements	Q1	10 Youth
2.5	Exploring direct marketing linkages for corporate units in the Gulf Region	Q2	5 Corporate firms

### iii. TECHNICAL TRAINING

**Necessity:** The cluster lacks quality training at all levels. If the growth has to be sustained training will have to play a major role in the cluster

**Expected Outcome:** Implementation of best cultivation practices/ post harvest practices in the cluster

SI_No	Activities	Time period	Beneficiaries
3.1	3 Day technical training programme for labour	Q1-Q4	25 Small units
3.2	3 Day technical training programme for supervisors	Q1-Q4	25 Small units
3.3	Training on post harvest management practices	Q2	10 Small units

#### iv. Improvement in infrastructure facilities

**Necessity:** There are many gaps in the infrastructure chain. Unless these gaps are addressed, good quality cannot be delivered to the end consumers. There is an immediate need to take up some of the gaps and bridge them.

**Expected Outcome:** The overall infrastructure would improve for the cluster

SI_No	Activities	Time period	Beneficiaries
4.1	Setting up information center for dissemination of information on floriculture	Q3	
4.2	Initiate flower lab	Q2	
4.3	Setting up of Auction center in Pune	Q1-Q4	
4.4	Introducing MCGF with small farmer units	Q1-Q2	10 Small firms

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#### v. Formation of groups/ societies / networks

**Necessity:** The groups will become the vehicle for various initiatives on networking with support institutions/training institutions and common agendas like common transport of flowers to big cities, joint participation in exhibitions etc.

**Expected Outcome:** 2 groups would be created/ strengthened

S.No	Activities	Time period	Beneficiaries
5.1	Formation of two groups for joint initiatives	Q1-Q4	18 Firms
5.2	Strengthening of floriculture cooperative society	Q1-Q4	

## vi. Networking small farmer units with medium corporate units

**Necessity:** As on date, the medium corporate units have spare capacity in both post harvest facilities and international marketing. However they are not keen to increase area under cultivation but are looking for a satellite of small farmer units to attach to them with whom they can have a mutually benefiting relationship. The small farmer can expect technical support from large units and large units can buy the produce of small farmers to be marketed for exports.

**Expected outcome:** At least one such network will come up

Sl.No	Activities	Time period	Beneficiaries
6.1	Working out one model of subcontracting floriculture farming	Q1-Q2	7 Small farmer units

## vii. Diversification

The three flowers varieties i.e. gerbera, carnation & rose have limitations in the market. The farmers should diversify into plantations like Anthurium and other flowers.

## viii. Subcontracting model

Develop subcontracting model with one corporate unit and about 20 small farmers of Maval block.

## ix. Institutional linkages

Linkages with the institutions in cluster development should be strengthened

## 7. KEY ISSUES AND ACTION PLAN

Key Issues	Actions Recommended	Short Term	Middle Term	Nodal Agencies
Policy Change	Declaration of Floriculture as agriculture activity.	√		Govt. of India
	Adoption of consortium approach by private floriculturists.	√	√	APEDA, NHB , NABARD, EXIM Bank.
	Accelerating the progress of Tanflora (see Annexure 3)	√		APEDA

<b>Location</b>	New locations near Mumbai, Bangalore and Chennai at altitudes of 1800-2000 m.	√	√	
	Adoption of feasibility norm for an independent unit in the range of 7-15 Ha.		√	Agencies mentioned in Annexure 4.
<b>Scale of Production</b>	Removal of unnecessary existing procedures as given in Annexure 2.	√	√	Agencies mentioned in Annexure 4.
	Simplification and transparency in existing procedures.	√		ICAR
	Establishment of linkages between research institutes and flower producers	√	√	Govt. of India
	Use of diplomatic linkages for obtaining timely space in aircrafts.	√	√	Govt. of India
	Use of diplomatic linkages for reducing import duties in European markets.	√	√	APEDA
<b>Establishment of linkages</b>	Subsidizing establishment of market offers by leading floriculturist in major markets.	√	√	APEDA
	Subsidizing test marketing by private floriculturists of Indian flowers abroad	√	√	State Govt.
<b>Market Development</b>	Provisions of black top, all weather roads to every Floriculture units.	√	√	State Govt.
	Provision of adequate water to all Floriculture units.	√	√	State Govt.
<b>Infrastructure Development</b>	Provisions of cold storage facilities at Mumbai , Chennai , Hyderabad and Bangalore airports	√	√	State Govt. and Govt. of India
	Training to customs officials for faster and careful clearance.	√	√	APEDA, Govt. of India

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<b>Finances</b>	Reduction of interest rate on term loan to less than 10%	√	√	RBI, NABARD.
	Recognition of long gestation period for return on investments by banks.	√	√	RBI, NABARD.
	Training to bankers in hi-tech bank branches.	√	√	RBI, NABARD.
<b>Taxation and incentives</b>	Relief in income-tax	√	√	Govt. of India
	Removal of excise duty on floriculture products	√	√	State Govt. and Govt. of India
	Removal of tax on royalties to breeders paid abroad.	√	√	RBI.
<b>Research and Development</b>	Development of suitable types and materials for poly-houses.	√	√	ICAR / CSIR/SAUs
	Development of indigenous pesticides and fungicides.	√	√	ICAR / CSIR/SAUs
	Development of varieties similar to those exported.	√	√	ICAR / CSIR/SAUs
	Development of indigenous flowers and varieties for export should be promoted regionally.	√	√	ICAR / CSIR/SAUs
	Development of better and high yielding varieties for domestic market.	√	√	ICAR / CSIR/SAUs
	Studies on role of ornamental plants in controlling pollution.	√	√	ICAR / CSIR/SAUs
	Development of protocol for post harvest technologies in different climatic conditions.	√	√	ICAR / CSIR/SAUs.
	Development of packaging standards and materials for domestic transport.	√	√	ICAR and Indian Inst. Of Packaging
	Manuals on cultivation practices for different flowers in different climatic conditions	√	√	ICAR /SAUs.
Preparation of manuals for organic farming of flowers.	√	√	ICAR /SAUs.	

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<b>Other</b>	Development of a post-graduate level course in floriculture	√	√	ICAR /SAUs.
	Training on Good Agriculture Practices to present floriculturists	√	√	ICAR and State Govt.
	Development of portals on Floriculture for grower-to-buyer selling. (Domestic and export)	√	√	Funding by NABARD to private entrepreneurs

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## ANNEXURES

**Table 1 Main Exporting Countries for cut flowers. (In million of US \$)\***

Sr. No	Exporting Countries / Areas	1991		1995	
		Value	Percent	Value	Percent
1	Netherlands	2147.4	64.0	2102.2	56.5
2	Colombia	387.1	11.5	525.0	14.1
3	Israel	145.9	4.3	158.7	4.2
4	Kenya	53.6	1.6	103.5	2.7
5	Ecuador	22.1	0.6	102.2	2.7
6	Italy	113.2	3.3	92.3	2.4
7	Thailand	75.5	2.2	80.5	2.1
8	Spain	70.3	2.0	60.0	1.6
9	Zimbabwe	16.6	0.4	51.9	1.3
10	France	31.9	0.9	39.6	1.0
11	New Zealand	17.1	0.5	37.1	0.9
12	Malaysia	11.5	0.3	29.6	0.8
13	United States	15.0	0.6	26.1	0.7
14	Mexico	18.8	0.5	27.9	0.7
15	Costa Rica	15.0	0.4	23.3	0.6
16	Singapore	17.8	0.5	22.7	0.6
17	Belgium-Luxembourg	6.6	0.1	21.6	0.5
18	Australia	16.8	0.5	20.6	0.5
19	Germany	16.9	0.5	26.2	0.5
20	Morocco	15.0	0.4	17.4	0.4
21	South Africa	16.1	0.4	17.4	0.4
22	United Kingdom	15.3	0.4	16.4	0.4
23	Turkey	12.6	0.3	13.0	0.3
24	India	2.0	0.0	11.4	0.3
25	Guatemala	5.1	0.1	10.7	0.2
26	Mauritius	5.4	0.1	6.7	0.2
	<b>Total</b>	<b>3351.7</b>	<b>100.0</b>	<b>3716.8</b>	<b>100.0</b>

- Adopted from Floriculture Today (1998), pp. 15-27.

**Table 2 World Exporters of Floriculture Products (in thousands of US \$)**  
**(www.pathfastpublishing.com from Customs and Excise)**

Rank		Country	% Change	1999 Total	Bulbs	Plants	Cut Flowers	Cut Foliage
98	99							
1	1	Netherlands	-8	4,078,068	641,169	1,2689292	2,095.183	72,787
2	2	Colombia	-9	550,149	133	1,252	546,210	2,554
4	3	Italy	-1	295,940	2,034	160,466	67,921	65,519
3	4	Denmark	-9	287,482	3,040	251,650	4,659	28,133
6	5	Belgium	0	273,800	9,917	222,395	33,195	8,293
7	6	Canada	8	267,850	13,101	184,184	15,716	54,849
5	7	USA	-22	217,611	10,645	89,887	14,762	102,317
9	8	Ecuador	4	211,340	3	615	210,409	313
10	9	Germany	-1	199,973	6,302	150,340	25,303	18,028
8	10	Israel	-27	166,999	9,862	25,466	115,884	15,787
11	11	Costa Rica	-1	160,722	295	55,830	27,616	76,981
13	12	Kenya	12	156,471	93	13,753	141,326	1,299
12	13	Spain	-13	138,556	618	49,655	85,450	2,833
14	14	France	-1	122,701	4,659	79,261	26,246	12,535
17	15	Mexico	4	61,392	66	11,118	30,607	19,606
16	16	Thailand	1	61,051	2,010	7,852	50,175	1,014
15	17	Zimbabwe	-4	60,104	12	1,198	58,810	84
18	18	Guatemala	7	57,257	54	23,445	7,949	25,809
23	19	Taiwan	36	42,852	1,745	27,736	12,834	537
20	20	China	19	40,951	1,561	11,317	5,075	22,998
24	21	UK	37	38,790	9,762	11,553	16,489	986
22	22	New Zealand	13	35,675	6,713	3,343	25,071	548
19	23	South Africa	-8	35,146	3,676	5,316	13,468	12,686
25	24	Poland	10	29,084	4,946	15,784	1,713	6,641
21	25	India	-19	26,716	734	1,648	8,482	15,852
27	26	Australia	8	24,770	483	2,317	17,334	4,636
28	27	Turkey	-9	20,550	2,757	2,757	13,401	1,635
26	28	Singapore	-22	19,496	25	7,933	7,937	3,601
29	29	Zambia	20	16,997	-	28	16,969	-
30	30	South Korea	31	16,216	35	3,247	12,884	50

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Rank		Country	% Change	1999 Total	Bulbs	Plants	Cut Flowers	Cut Foliage
98	99							
31	31	Brazil	10	13,218	4,144	7,607	516	951
38	32	Malaysia	55	11,859	42	3,034	5,979	2,804
32	33	Portugal	5	11,569	66	9,428	1,603	652
41	34	Chile	51	9,793	5,016	53	3,610	1,114
40	35	Tanzania	37	9,710	-	1,910	7,800	-
34	36	Hungary	-10	9,591	29	7,513	717	1,332
37	37	Uganda	22	9,363	-	2,748	6,615	-
35	38	Sri Lanka	-11	8,550	79	4,462	859	3,150
33	39	Morocco	-23	8,308	-	1,218	7,067	23
39	40	Honduras	3	7,499	-	7,366	18	115
44	41	Ireland	20	6,741	335	2,026	1,380	3,000
48	42	Austria	44	6,142	363	4,635	506	638
42	43	Japan	1	6,037	1,538	4,466	11	22
43	44	Peru	-2	5,740	3	38	5,437	262
47	45	Philippines	10	4,959	126	499	580	3,754
46	46	Sweden	8	4,902	618	3,883	564	641
36	47	Dominican Rep.	-49	4,044	1	2,144	1,690	209
45	48	Mauritius	-22	3,847	-	7	3,779	61
50	49	Ivory Coast	-3	3,334	-	923	2,182	229
53	50	Indonesia	61	3,303	76	2,292	59	876
57	51	Canary Isles	62	2,594	-	1,939	604	51
49	52	El Salvador	-29	2,573	3	974	-	1,596
52	53	Czech Rep.	-2	2,257	19	1,630	126	482
55	54	Egypt	28	2,228	4	1,602	576	46
54	55	Norway	14	2,035	96	621	158	1,160
58	56	Switzerland	6	1,344	47	1,174	19	104
51	57	Malawi	-61	1,219	-	-	1,110	109
66	58	Hong Kong	41	1,165	6	1,098	7	54
56	59	Finland	-34	1,095	78	89	183	745
62	60	Cameroon	12	1,072	14	44	703	311
63	61	Cuba	15	1,059	6	1,048	2	3
61	62	Tunisia	-3	977	-	598	344	35
59	63	Greece	-25	921	4	742	79	96

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Rank		Country	% Change	1999 Total	Bulbs	Plants	Cut Flowers	Cut Foliage
98	99							
60	64	Togo	-12	912	-	910	2	-
69	65	Vietnam	36	906	-	50	787	69
73	66	Ethiopia	96	894	-	543	351	-
64	67	Venezuela	-7	826	-	30	729	67
71	68	Argentina	40	792	19	746	27	-
72	69	Uzbekistan	32	732	6	726	-	-
67	70	Madagascar	-11	729	23	48	11	647
	71	Luxembourg	NEW	691	74	462	145	10
77	72	Slovakia	75	561	-	499	-	62
68	73	Surinam	-31	542	-	3	310	229
75	74	Jamaica	14	456	-	99	244	113
70	75	Romania	-29	436	71	107	58	200
79	76	Serbia	736	418	-	406	12	-
74	77	Slovenia	-6	380	69	78	-	233
76	78	Trinidad	-50	179	-	-	166	13
65	79	Estonia	-80	172	-	23	91	58
78	80	Saudi Arabia	80	172	-	23	91	58
		Total	-6	7,914,629	749,734	2,785,021	3,769,443	610,430

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**Table 3 Export of Cut Flowers from India (1995-1999)**

Year of Export	Value of Total Export (In Lakh Rs.)
1991-1992	683
1992-1993	844
1993-1994	1192
1994-1995	2258
1995-1996	4649
1996-1997	5043
1997-1998	7221
1998-1999	7616

**Table 4 Total Export of Fresh Cut flowers from India, 1995-96 to 1998-99  
(Share of Major countries).**

Sr. No.	Country	Value (Rs. Lakhs)				Share (Percent)				Change in Percent *
		1995-1996	1996-1997	1997-1998	1998-1999	1995-1996	1996-1997	1997-1998	1998-1999	
1	Australia	36.58	49.72	158.00	210.86	0.79	0.99	2.19	2.77	476.42
2	Austria	5.95	13.53	0.35	43.99	0.13	0.27	0.00	0.58	639.89
3	Belgium	27.88	25.33	93.25	53.98	0.60	0.50	1.29	0.71	93.64
4	Canada	20.97	15.22	14.40	22.99	0.45	0.30	0.20	0.30	9.62
5	Denmark	8.50	0.00	0.50	203.94	0.18	0.00	0.00	2.68	2300.51
6	France	54.89	96.62	207.06	192.67	1.18	1.92	2.87	2.53	251.02
7	German F Rep.	652.57	819.85	947.53	754.81	14.04	16.26	13.12	9.91	15.67
8	UK	365.46	414.60	556.71	408.33	7.86	8.22	7.71	5.36	11.73
9	Italy	152.41	140.18	291.52	253.92	3.28	2.78	4.04	3.33	66.60
10	Japan	530.53	865.96	780.08	1437.01	11.41	17.17	10.80	18.87	170.87
11	Netherlands	760.70	970.67	1605.50	1446.01	16.36	19.25	22.23	18.99	90.09
12	New Zealand	3.37	6.38	8.42	20.46	0.07	0.13	0.12	0.27	506.26
13	Saudi Arabia	48.10	28.47	20.52	47.80	1.03	0.56	0.28	0.63	-0.62
14	Singapore	15.25	54.03	164.92	270.03	0.33	1.07	2.28	3.55	1670.45
15	Switzerland	5.24	8.85	27.48	72.78	0.11	0.18	0.38	0.96	1290.12
16	U Arab Emts	33.08	49.10	92.03	140.37	0.71	0.97	1.27	1.84	324.34
17	USA	1578.12	1195.83	1774.06	1419.98	33.95	23.71	24.57	18.65	-10.02
<b>Total</b>		4299.58	4754.37	6741.88	6999.93	92.49	94.28	93.36	91.91	62.81
<b>Grand Total</b>		4648.86	5042.56	7221.42	7615.68	100.00	100.00	100.00	100.00	63.82

\* Change in value during 1995-95 and 1998-99

Sources: Export Statistics for Agro and Food Products, India, 1998-99 , APEDA  
Monthly Statistics for the Foreign Trade of India, Annual Number for 1995-96.